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Evidence from Finnish Municipalities

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Abstract

Even though Finland has proportional elections, single-party control in Finnish local councils is not uncommon contrary to what one might expect. The largest party holds more than half of the seats in every third Finnish local council and is thus likely to govern alone. This study investigates whether single-party and coalition governed municipalities differ in their economic outcomes. Common pool models predict that when there is a governing coalition, all the parties aim to target some spending at their core constituents, while costs are shared equally across all parties. This would mean that coalition governments result in higher spending.

Using data from 445 Finnish municipalities for the years 1980–2010, I provide causal evidence that is consistent with the predictions of common pool models. Estimates suggest that single-party control decreases total expenditures and revenues by around 200–300 euros per capita. I also analyze the effect in several areas of spending and revenues, but do not find any clear results. I exploit close elections as a source of exogenous variation using a regression discontinuity design (RDD) approach tailored for proportional elections.

Keywords: single-party control, coalition governments, common pool problem, municipal elections, proportional system, regression discontinuity design

JEL classification: H71, H72, R50

Tiivistelmä

Suomessa on käytössä suhteellinen vaalitapa, mutta yhden puolueen enemmistöt kunnanvaltuustoissa ovat tavallisia. Suurimmalla puolueella on yli puolet valtuustopaikoista yli joka kolmannessa valtuustossa. Tällöin on todennäköistä, että puolue vastaa päätöksenteosta yksin. Tässä tutkimuksessa selvitetään, eroavatko yhden puolueen ja koalitioiden johtamat kunnan taloudellisilta lopputulemiltaan. Common pool -mallien mukaan koalitiohallinnossa puolueet haluavat kohdistaa kulutusta omiin eturyhmiinsä. Samaan aikaan ne jakavat tämän kulutuksen kustannukset keskenään. Lopputuloksena koalitiohallinto saattaa kuluttaa enemmän kuin yksipuoluehallinto.

Tutkimuksessa on käytössä aineisto 445 Suomen kunnasta vuosille 1980–2010, ja siinä hyödynnetään regressioepäjatkuvuusmenetelmää kausaalivaikutuksen selvittämiseksi. Tulokset ovat linjassa niin kutsuttujen common pool -mallien kanssa. Estimaattien mukaan yksipuoluevalta laskee henkilöä kohti laskettuja kokonaiskustannuksia ja -tuloja noin 200–300 eurolla. Tutkin vaikutusta myös yksittäisillä kulutuksen ja tulojen alueilla, mutta en löydä selkeitä tuloksia. Hyödynnän täpäriä vaaleja eksogeenisen variaation lähteenä käyttämällä regressioepäjatkuvuusmenetelmää (RDD) suhteellisten vaalien järjestelmään sovellettuna.

Asiasanat: yksipuoluevalta, koalitiot, common pool -ongelma, kunnallisvaalit, suhteellinen vaalitapa, regressioepäjatkuvuus

JEL-luokittelu: H71, H72, R50

Contents

1 Introduction

Currently, decision-making power is concentrated on one party in approximately every third of the 320 local councils in Finnish municipalities, even though there is usually a rich variety of parties contesting local elections. Concentrated political power is not only a recent phenomenon. In particular, the Center Party and the Swedish People's Party have held an absolute majority of council seats in a significant fraction of municipalities for decades. This has been an intensively discussed topic. Some have claimed that absolute majorities even spoil municipal decision making by implementing selfish policies, whereas others have argued that the existence of these majorities is not a big problem if it is a problem at all. In any case, it is the absolute majority of representatives in a local council that has the final mandate to make decisions.

On the one hand, if one party has the absolute majority, it can basically implement policies without having to negotiate with other political groups. On the other hand, if none of the parties controls over half of the seats, parties will have to form coalitions and make decisions together. Does single-party control in a local council have some sort of effect on public expenditures and the way that they are financed? That is to say, do single-party and coalition governments differ from each other in their economic outcomes?

Considering the important economic role of municipalities in Finland, who governs them would seem to be an intresting question. For instance, to characterize the importance of municipalities in Finland, municipal spending is around 20% as share of GDP and municipalities employ roughly 20% of the total Finnish workforce.

Political economics and political science literature commonly claim that all parties in a government want to target some spending at their core constituents in order to get re-elected. The costs of these policies are divided equally between all parties in the government. This might lead to a situation in which coalition government spends, taxes and possibly accumulates higher debt than a single-party absolute majority government would. This view has its roots in the so-called common pool problem. Weingast et al. (1981) were the first to propose a pork barrel model with multiple local groups or political actors who can independently decide how much they spend. The benefits from this spending are local, but the spending is financed from a common pool of global tax revenues. This might lead to higher spending under coalition governments than under a single-party government.

My empirical results using data from Finnish municipalities are mainly in line with the predictions of common pool models. I show that municipalities governed by a single party spend less than those governed by coalitions in the first three years of their electoral term. My estimates suggest that, on average, single-party control decreases total expenditures and revenues by around $200 - 300$ euros per capita. The common pool problem between parties could be a reasonable explanation for these findings. However, it seems that there are no major differences in election years. One possibility is that single-party governments change their behavior in election years and spend more in order to enhance their re-election prospects as suggested by e.g. Khemani and Wane (2008). I also analyze spending and revenues in different areas. Spending in several areas follows the same pattern as total expenditures, but the effect on tax revenues and deficits is not that clear. I find some evidence that single-party control has a negative effect on total debt, supporting so-called "weak government hypothesis" first discussed by Roubini and Sachs (1989a, 1989b). They propose that more fragmented governments, i.e. governments formed by larger coalitions, tend to borrow more.

I use data from 445 Finnish municipalities between the years 1980 and 2010. These data were collected from the Altika database of Statistics Finland. Altogether, the data set contains 13,104

municipality-year observations. I exploit close elections as a source of exogenous variation using a quasi-experimental regression discontinuity design. Close election outcomes are considered to be as good as if they were random. The idea behind regression discontinuity design is not complex. A party has full control of decision making once it gains over half of the seats. If its seat share is less than half, it is a coalition of parties that makes the decisions. In RDD, identification of the causal effect is based on comparing cases in which the largest party almost won a majority of seats to those in which the largest party almost lost its majority position. If these units have on average similar characteristics with the exception that only those above the threshold value receive the treatment, all differences in outcomes should come entirely from the treatment. This difference or "discontinuity gap" can be interpreted as an average treatment effect across all political units. I run several robustness checks and validity tests to verify the reliability of the results.

One difficulty is that using a vote-share-based threshold and vote share as an assignment variable is inadequate in a proportional election system, such as in Finland, as control over more than half of the seats can be obtained with less than 50% of votes. Seat thresholds are determined after the election, and they cannot be known beforehand. Petterson-Lidbom (2008) uses seat share as a running variable in his regression discontinuity study of party effects in Swedish municipalities. However, this approach involves problems that I will discuss later. I propose a novel way of computing the running variable directly using the seat division rule. My solution is closely related to the approach of Folke (2012).

Freier and Odendahl (2012b) study the same question using local-level data from the German state of Bavaria. They also use close elections as a source of exogenous variation and define them by running computer simulations. According to their results, single-party control tends to increase expenditures, property taxes and total debt. Garmann (2012) uses data from municipalities in the German state of North Rhine-Westphalia and compares fiscal outcomes in coalition and single-party governments. He uses regression discontinuity design with a $50-50$ seatshare threshold to identify the causal effect and finds that single-party governments have lower personnel expenditures. He does not find significant results in other areas of spending. In another paper, Garmann (2013) studies the same topic using an alternative approach. He uses regression kink design exploiting a slope change in the treatment probability when the strongest party has at least 50% of the votes. With this strategy, he reaches a substantially different conclusion that coalition governments significantly decrease expenditures.

The relationship between government size and spending has also been examined in some earlier contributions. In general, they provide results consistent with the idea of common pool models. See, for instance, Roubini and Sachs (1989a, 1989b) and Bawn and Rosenbluth (2006), Perotti and Kontopoulos (2002), Schaltegger and Feld (2009) and Persson et al. (2007). However, most of these studies differ from this one in the sense that they compare multiple democratic countries with different kinds of institutional settings. For instance, some of these countries have a majoritarian system favoring two-partyism, whereas some have proportional elections with more parties. This study compares different units, namely single-party and coalition-governed municipalities, within the same electoral system and with the same institutional background.

The structure of this study is as follows. Section 2 introduces the theoretical framework. Section 3 reviews the institutional background and the data used in this study. Section 4 outlines the empirical strategy. The results and their interpretation are given in Section 5. Finally, Section 6 concludes.

2 Theoretical Framework

Economic theories related to differences in spending between single-party and coalition governments provide mixed predictions. The most commonly heard argument, arguably, is that single-party governments spend less than coalition governments due to so called common pool problem. Benefits of some policy are local or affect only a certain part of the population, but the financing is global and taken from a common pool of resources. For example, Weingast et al. (1981) present a pork barrel model with multiple local groups or political actors that can independently decide how much they spend. These groups finance their spending from a common pool of global tax revenues. As the political actors are seeking re-election, the costs and benefits for their own constituents are more important than those of other groups. Weingast et al. show that in Nash equilibrium this kind of behavior leads to overspending. The common pool problem leads to a common statement in the literature. It is often argued that coalition governments spend more than single-party governments.[1] The explanation for this claim is that all parties in a government aim to target some spending to their core constituents to ensure re-election. The costs of these policies are divided between all parties in the government. This might lead to higher aggregate spending than under single-party control. On the other hand, if spending increases, also revenues must be adapted.

In a more recent contribution, Persson et al. (2007) suggest a model of an electoral common pool problem in coalitions of parties. Their theoretical model predicts that electoral competition inside coalition governments causes higher spending than under single-party governments. The basic idea is as follows. Different parties in the government decide independently how much to spend on the public good consumed by their core constituents, and this spending is financed from a common pool of taxes. The electoral rule, i.e. whether there is a majoritarian or a proportional electoral system, affects government spending indirectly. Consistent with Duverger's law, a well-known rule in political science, Persson et al. assume that proportional elections lead to a more fragmented party system and thus coalition governments are more common than in majoritarian elections. Furthermore, they argue that there are differences in magnitudes of spending in different types of electoral systems.

Although the common pool explanation of government composition and spending differences is quite widely accepted, contradictory views have also been proposed. Freier and Odendahl (2012b) suggest two alternative conceptual frameworks to rethink the topic and to supplement their empirical analysis of single-party governed municipalities in the German state of Bavaria. The first framework is based on indivisibilities of spending. Freier and Odendahl argue that these could lead to higher spending under single-party governments than under coalition governments. The agenda-setter who has to offer all coalition members at least their reservation utility will have to offer other coalition members their preferred project, because taxation without their preferred project would be lower than their reservation utility. Thus, the agenda-setter has to choose whether to implement all the coalition members' projects or none. It could be the case that none of the projects is implemented, depending on the valuation of them. But, if there was a single-party government, it would have to choose between implementing its preferred project or not. Freier and Odendahl reason that this might lead to higher spending than under a coalition government if some assumptions about the value of the project are satisfied.

[1] I stress that there is not a separate government and opposition in Finnish municipal councils. In the context of Finnish local councils, "government" equates to the party with an absolute majority or the parties that have formed a coalition holding over half of the seats and "opposition" to the parties that hold less than half of the seats, and hence do not have a very large influence on decision making. All parties, both in "opposition" and "government", are members of the council.

The second idea of Freier and Odendahl (2012b) is related to so-called strategic use of debt. The strategic use of debt has its roots in the work of Persson and Svensson (1989) and Alesina and Tabellini (1990), the latter in particular being is relevant to Freier and Odendahl's setting. In the strategic debt model of Alesina and Tabellini, there are two political parties that differ in their preferences for two distinct public goods. When the probability of re-election is small for one party, it will overspend on its preferred public good. This spending is financed by taking higher debt, which furthermore ties the hands of the successor government. Alesina and Tabellini show that the equilibrium debt is larger the less likely the re-election of incumbent government is. Freier and Odendahl reason that if there is a close election and some party has barely won a majority of seats, it might expect that the probability of losing the next election is considerably high. Fearing being defeated, the majority party starts maximizing the utility of its core constituents by increasing spending. At the same time they affect the policy possibilities of the next government by financing this spending by borrowing.

What Freier and Odendahl (2012b) do not take into account, but which could affect incumbent politicians' behavior, is the role of swing voters in elections. The presence of swing voters might have a different effect in cases of single-party governments and coalition governments. When certain assumptions regarding the size of political groups are satisfied, it could be the case that a single-party government has to attract more swing voters than a coalition government in order to get re-elected. For example, in the model of Feddersen and Pesendorfer (1996), swing voters ultimately determine the election outcomes. It is possible that the government has to use spending as an instrument to win over swing voters, as suggested by Dixit and Londregan (1995, 1996). Khemani and Wane (2008) capture such phenomena in their political economy model of populist fiscal policy. In their model, a single-party government tends to spend more and tax more than a coalition of multiple parties. The government in power either implements policies that maximize the utility of its constituents or policies that guarantee its re-election. In the latter case, the government provides more public good to receive more swing voters' votes, which it needs in order to stay in power. Khemani and Wane show that single-party governments spend more on aggregate and collect greater tax revenues than coalition governments, when certain reasonable assumptions regarding group sizes are satisfied.

3 Institutional Background and Data

3.1 Finnish Municipalities

Municipalities have a very important role in the Finnish system.[2] It is stated in the Finnish constitution that they are self-governing units. Their economic importance can be characterized by the fact that municipality spending as a share of GDP is around 20% and municipalities employ roughly 20% of the total Finnish workforce. On average, they decide of budgets on about 5,000 euros per capita annually. Municipalities have a wide range of responsibilities which are stated in the Municipal Act (*Kuntalaki*). These statutory responsibilities include social and health care, primary education, childcare, town planning, civil engineering (e.g., maintaining roads, waste management, water management) etc. Many municipalities also provide some services voluntarily, such as cultural services or secondary education. To cover these expenditures, Finnish municipalities are allowed to collect taxes and out-of-pocket payments from the users of municipal services. In addition, municipalities receive a share of corporate taxes and grants from central government. According to the Municipal Act, municipalities should

[2] Moisio et al. (2010) provide an extensive overview of Finnish municipalities.

have balanced budgets. In practice, however, Finnish municipalities can borrow money without any restrictions or punishments for overspending being imposed by central government.

The number of municipalities in Finland has been decreasing since the Second World War. This is due to voluntary municipal mergers, which central government has seen as a potential way of dealing with problems caused by an ageing population and domestic migration.[3] The first large wave of municipal mergers was experienced just after the war, the second in the late 1960s and early 1970s, and the present one started in the beginning of the millenium. Currently, there are 320 municipalities. To illustrate the decreasing trend in the number of municipalities: there were 452 municipalities in 2000 and 602 in 1940.

The majority of Finnish municipalities have a relatively small population, though due to municipal mergers some smaller municipalities have disappeared from the Finnish map. On average, municipalities had a population of around 16,000 in 2011, and the median was slightly below 6,000. At the present, the smallest municipality (Suomenniemi) in mainland Finland has a population of about 760 people, whereas the largest municipality (Helsinki) has approximately 590,000 inhabitants. Finland also has an autonomous region called Åland where there are even smaller municipalities. However, municipalities located in Åland Islands are omitted from this study due to the special characteristics of the region.

3.2 Municipal Decision-Making and Elections

Decision-making in Finnish municipalities is led by local councils, the duties of which are defined in the Municipal Act. According to the Municipal Act, "the local council is responsible for the operation and economy of the municipality". The council appoints a municipal executive board to prepare decision-making. The council can also set up committees to deal with different functions, for example, social and health services, education or urban planning. As executive boards, the committees usually have a preparatory role. Despite the existence of the board and the committees, the local council always makes the final decisions. Decisions are taken by a simple majority of the council members. The members of the executive boards and committees are generally local politicians but not necessarily members of the council, and the composition of the boards and committees is based on the seat shares in the local council.[4] Municipal councils are chosen in municipal elections that are organized according to the Municipal Act and the Electoral Act (*Vaalilaki*). A new municipal council is elected every fourth year (e.g. 1976, 1980, 1984 etc.), on the fourth Sunday of October. The council's term starts at the beginning of the next calendar year and ends at the end of the next election year. The election system is proportional representation, and it is an open and unordered list system. That is to say, a voter votes for an individual candidate and not a party directly. Seats in the municipal council are shared using the d'Hondt method, and the number of seats depends on the size of the population.[5]

In the d'Hondt method, a comparative index is calculated for each candidate and the candidates are arranged according to their indices, after which the seats are shared out. Comparative indices are calculated so that the candidate who receives the most votes of the candidates of his party gets a comparative index that equals the total votes of the party. The candidate with the second most votes

[3] For a list of municipal mergers in Finland, see Kuntaliitto (2012).

[4] This is a fundamental difference compared to majoritan systems, such as the system in the United States. Even if a party has an absolute majority of seats, it does not necessarily have total control over all decision-making bodies.

[5] The council sizes for different population groups are: population less than or equal to 2,000 (council size 13, 15 or 17), 2,000–2,001 (21), 4,001–8,000 (27), 8,001–15,000 (35), 15,001–30,000 (43), 30,001–60,000 (51), 60,001–120,000 (59), 120,001–250,000 (67), 250,001–400,000 (75) and over 400,000 (85).

gets a comparative index that equals half the total votes of his party, the candidate with the third most votes gets total the votes divided by three, etc. If two candidates in the same party receive the same number of votes, lots are drawn between them. Furthermore, if two candidates from two different parties have the same comparative index, their order in the final list is drawn. Parties are also allowed to form electoral alliances. If there is an electoral alliance between two parties, they are treated as if they were one party when the seats are shared out. Both ideological and technical alliances occur. Sometimes, two or more parties that share similar ideas form an ideological alliance, sometimes parties become technical allies just to enhance their position in the electoral competition, as the electoral system favors larger parties.

Political parties that are in the party register and other groups that have collected enough supporters are allowed to field candidates in elections. Municipal elections have been dominated by the three large parties from the political left, center and right: the Social Democratic Party, the Center Party and the National Coalition Party. The Center Party has traditionally held the largest share of seats even if it has not had the largest share of votes. Other parties that hold seats in municipal councils include the Left Alliance, the Green Party, the True Finns, the Swedish People's Party and the Christian Democrats. Many municipalities also have local, often independent or one-agenda political groups that are not registered parties but hold seats in local councils. In single-party governed municipalities, it is usually the Center Party that has the absolute majority. The hegemony of the Center Party at local level is partly due to its past as an agrarian party. Also, the Swedish People's Party holds an absolute majority of seats in a large number of municipalities, especially in coastal regions where the majority of the Finnish Swedish-speaking population lives.

3.3 Data

Table 1 characterizes the data set used in this study. All the data on the economy, population and elections that I use in this study were obtained from the Altika database of Statistics Finland and the Official Statistics of Finland database. I observe nine municipal elections between the years 1976 and 2008 and use data from nine electoral terms during the period from 1980 to 2010. I pool the data for each year of the electoral term and analyze each year separately. The data set includes data from 445 municipalities for a varying number of years due to municipal mergers, making 13,104 municipality-year observations.

Most of the municipal economy data are observed for the whole time period, except property tax and total debt which are observed only from 1993. There are 7,481 observations of property tax and total debt. In total, the data set contains results for 3,778 elections starting from 1976. One party has received more than half of the council seats in 1,363 votes. The Center Party has won the absolute majority of seats in 1,126 municipal elections and the Swedish Party in 206 elections. In the rest of the cases, the absolute winner has been either the Coalition Party, the Social Democratic Party or some local political group.

Finnish municipalities mostly report their economic statistics in a similar way, though there are some deviations that should be mentioned. For example, some municipalities arrange health care services jointly with some other municipalities, whereas some municipalities arrange everything on their own.[6] The ways in which these municipalities enter their expenditures and revenues in their accounts

[6] These joint authories operate under municipal legislation and they are financed from the member municipalities' budgets. Joint authorities are mainly responsible for tasks that require a larger population base than a small municipality would have alone. For example, arranging health services jointly is very common. In 2010, there were 226 joint authorities in total. See e.g. Moisio et al. (2010) for further details.

can deviate from each other. Also, there have been actuarial changes in reporting expenditures or revenues in certain specific areas over time, which could raise some comparability issues.

Table 1: Descriptive Statistics

	Absolute majority	No absolute majority	Whole sample
Variable	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Total expenditures	5,173	4,932	5,020
	(1,038)	(1,047)	(1,050)
Social and health care expenditures	2,441	2,209	2,294
	(852.62)	(765.94)	(806.56)
Education expenditures	1,264	1,217	1,234
	(395.39)	(334.92)	(358.95)
Personnel expenditures	2,287	2,062	2,144
	(692.63)	(600.57)	(645.01)
Investments	569.44	595.03	585.66
	(440.59)	(415.25)	(424.87)
Total revenues	5,128	4,838	4,944
	(1,256)	(1,166)	(1,208)
Total tax revenues	2,138	2,384	2,294
	(486.46)	(596.83)	(571.32)
Municipal income tax	1,901	2,169	2,071
	(370.68)	(459.64)	(448.29)
Property tax	132.04	135.27	133.97
	(108.64)	(100.20)	(103.67)
Total debt	1,388	1,367	1,375
	(978.89)	(862.12)	(910.70)
Deficit (accounting period)	39.54	40.48	40.14
	(308.80)	(252.39)	(274.38)
Total population	4,528	16,028	11,818
	(4,029)	(40,224)	(32,591)
Council size	23.76	31.42	28.61
	(6.72)	(11.62)	(10.76)
Maximum seat share	63.45	38.85	47.85
	(11.83)	(6.37)	(14.74)

Notes: All expenditure and revenue data are per capita and expressed in 2010 euros. They have been deflated using the price index for municipal expenditures of Statistics Finland. $N = 13,104$ for all expenditure data and for all revenue data except property taxes and total debt, $N = 7,481$ for property tax and total debt and $N = 3,778$ for election results. The number of municipality-year observations in the treated group is $N = 4,798$ and in the non-treated group $N = 8,306$.

4 Empirical Strategy

There are several challenges in estimating the causal effect of single-party control on economic outcomes, as parties are not randomly selected to govern in municipalities. First, measuring voter preferences might be hard. The existence of unmeasured voter preferences might lead to omitted variable bias. If this is the case, correlation between single-party control and economic outcomes is not nec-

essarily a sign of a causal relationship between the variables. Another possibility is that underlying conditions have led to single-party control in Finnish municipalities. In this case, there could be bias caused by simultaneous causality. Endogeneity becomes an issue in these situations, i.e. the error term is correlated with the explanatory variables.

This paper attempts to deal with the endogeneity by building up a regression discontinuity design and exploiting the quasi-experimental nature of close elections in a similar way to many recent empirical studies in political economics. The method was first proposed by the psychologists Thistlethwaite and Campbell (1960) for the evaluating university scholarship programs. However, it was not until the late 1990s that the method became popular among economists. Lee and Lemieux (2010) provide an extensive overview of regression discontinuity designs in economics. Their paper also includes a comprehensive list of previous studies in many fields of economics using RDD.[7]

The first researchers to apply the method in political economics include Petterson-Lidbom (2008) and Lee et al. (2004).[8] Petterson-Lidbom investigates the effect of party control on economic outcomes using data from Swedish municipalities. He divides parties into two blocs, socialist and non-socialist, and uses RDD to compare the economic outcomes in municipalities governed by the two blocs. He concludes that there are notable differences between municipalities governed by different political blocs. Lee et al. study the impact of electoral strength on politicians' voting decisions in U.S. elections, i.e. do shifts in voters' preferences affect the incumbent party's behavior. They conclude that voters do not elect policies, but the incumbent implements partisan policies. Both Petterson-Lidbom and Lee et al. use close elections as a source of exogenous variation, as close elections are considered to be as good as if they were random. They point out the simple fact that party control changes discontinuously at the 50% vote (or seat) share threshold. Identification in their regression discontinuity designs is based on using units that are just below and just above this treshold, i.e. close election outcomes. On average, these units have similar characteristics with the exception that only those above the treshold value of 50% vote share receive the treatment. Thus, all differences in outcomes should come entirely from the treatment. This "discontinuity gap" between the units on both sides of the discontinuity threshold can be interpreted as an average treatment effect across all political units (Lee and Lemieux 2010).[9]

In (sharp) regression discontinuity design, treatment status is a deterministic function of some underlying variable,

$$D_i = \mathbf{1}\left(x_i \geq \overline{x}\right), \tag{1}$$

where $\overline{x}$ is a known threshold or cut-off and $\mathbf{1}(\cdot)$ is an indicator function that is assigned the value 1 if a unit receives the treatment and the value 0 if not. In the literature, the variable x_i is referred to as an "assignment", "forcing" or "running" variable. Treatment is a discontinuous function of x_i, i.e. no matter how close to $\overline{x}$ x_i is, treatment is unchanged until $x_i \geq \overline{x}$. All units with $x_i \geq \overline{x}$ belong to the treatment group, and units with $x_i < \overline{x}$ belong to the control group. The basic idea of RDD is to compare outcomes for units that are close to the threshold, i.e. the underlying targeting variable is just below or just above the cut-off point $\overline{x}$. On average, these units should have similar characteristics with the exception that only those above the cut-off point receive the treatment (Lee and Lemieux 2010).

[7] For a text book treatment of regression discontinuity designs, see the standard reference Angrist and Pischke (2009).

[8] The first working paper versions of these studies were Petterson-Lidbom (2001) and Lee et al. (2002).

[9] Since Petterson-Lidbom (2008) and Lee et al. (2004), RDD has been used to analyze political partisanship and politicians' voting behavior in a number of studies. See, e.g., Gerber and Hopkins (2011), Ferreira and Gyourko (2009) and Leigh (2007).

How should the assignment variable be chosen? The convention in RDD studies using data from majoritarian elections has been to use vote share as the running variable and 50% vote share as the cut-off point, when investigating the causal effect of party control on economic outcomes. However, using a vote-share-based threshold and vote share as the assignment variable is inadequate in a proportional election system, such as in Finland, as control over more than half of the seats can be obtained with less than 50% of the votes. Seat thresholds are determined after the election, and they cannot be known beforehand. Petterson-Lidbom (2008) suggests using seat shares instead of vote shares in his study of party effects on economic outcomes in Swedish municipalities. Swedish municipalities have proportional elections, too. Petterson-Lidbom's idea seems intuitively reasonable, since if one party gains more than half of the seats, it will most likely choose to govern alone. On the other hand, if none of the parties gains an absolute majority, i.e. maximum seat share is below 50% threshold value, a governing coalition will be formed. Even though using seat shares is probably a better idea than using vote shares, this approach involves problems. One issue is that seat share is very discrete which makes comparing outcomes within very narrow bands impossible. It is concerning that in my data, there are no observations very close to the 50% threshold of seat shares. The election data that I use include around 300 observations with a maximum seat share within the interval $[48, 52]$, but none within the interval (49, 51). Also, it is hard to believe that all elections resulting in some certain maximum seat share would have been equally close. For these reasons, I propose a new alternative way to compute the running variable.

Let us consider a municipality where the council has n seats. First, I find the $((n+1)/2)$th comparative index among the parties participating in the election using the d'Hondt method. Let c denote this comparative index. Now, the largest party must obtain more than $c(n+1)/2$ votes in order to get an absolute majority, i.e. $(n+1)/2$ seats when the votes of all the other parties are fixed. Note that $c(n+1)/2$ is not necessarily an integer. Hence, I take the ceil function from it, ie. round it up to the closest integer. Let this number of votes be $\hat{v}$. If the total number of votes in the municipality is V and the actual number of votes that the largest party received is v, then the value of the running variable s is given by

$$s = \frac{v - \hat{v}}{V}. \tag{2}$$

If s is negative, the largest party would have to gain more votes in order to obtain an absolute majority, and if s is non-negative, the largest party could lose votes and still hold an absolute majority of the seats. Otherwise, no party holds an absolute majority of seats and parties will form some sort of coalition that governs. The treatment in the regression discontinuity setting is now given by

$$D_i = \mathbf{1}\left(s_i \geq 0\right). \tag{3}$$

Units close to this threshold depict close election outcomes which furthermore are assumed to be as good as if they were random. In a sharp regression discontinuity framework, the treatment effect is formally given by

$$\lim_{s \to 0^-} \mathbb{E}[Y_i | s_i = s] - \lim_{s \to 0^+} \mathbb{E}[Y_i | s_i = s]. \tag{4}$$

Two caveats related to the computation of the running variable should be discussed before proceeding. I stress that the running variable does not necessarily measure the minimal vote change required

to receive or lose an absolute majority, which is the idea in RDD studies that use vote share as the running variable. It characterizes only the required vote change such that the largest party loses or gains an absolute majority when the votes of other parties remain unchanged. Therefore, it does not necessarily depict the actual closeness of elections particularly well for observations that are far from the cut-off point. However, arguably, it should work pretty well in the vicinity of the threshold. As the treatment effect is identified using observations close to the cut-off, this should not be too big a problem.

A second potential problem is that I do not have information about electoral alliances between parties, which could affect these calculations. It is possible that smaller parties are in electoral alliances that could prevent the largest party from obtaining an absolute majority position. It could also be that the largest party has an electoral alliance with a smaller party, thus helping it to achieve a majority. Fortunately, alliances are rare in municipal elections. Still, there are 41 observations in the election results with the running variable $s \geq 0$, while the actual seat share is less than 50%. Moreover, there are five cases in which the algorithm does not assign the largest party an absolute majority, even though it actually obtains more than half of the seats. The only possible reason for this are electoral alliances.[10]

A regression discontinuity design can basically be implemented in a number of ways, but essentially we choose either a parametric or a non-parametric approach. Both are used in this study, although the main emphasis is on the non-parametric approach. Consider first the following regression function characterizing the simplest case of parametric RDD:

$$Y_{it} = \alpha + \beta D_{it} + f(s_{it}) + \varepsilon_{it}, \tag{5}$$

where Y_{it} is the economic outcome in municipality i in year t, D_{it} is the treatment dummy defined as in equation (3), $f(s_{it})$ is some smooth function (a low-order polynomial) from the assignment variable s_{it} and ε_{it} is the error term. α is the intercept and β is the parameter of interest. If the regression discontinuity design is correctly implemented, especially, if $f(\cdot)$ is correctly specified, β should indicate the causal effect of the treatment D_{it} on the economic outcome Y_{it}. Note that we can estimate the control function separately for both sides of the threshold.

In the parametric approach, the whole range of data is exploited to fit a low-order polynomial to the observations. This could be a more effective design when there is limited number of observations available, especially close to the cut-off. In many recent applications, the estimations are carried out non-parametrically using local linear regression. For instance, Hahn et al. (2001) provide a comprehensive representation of implementing RDD using local linear regression. Practical issues are also discussed by Imbens and Lemieux (2008) and Lee and Lemieux (2010). In short, the idea is to identify the treatment effect using data within a band of width h around the cut-off point. Identifying the treatment effect in some closer environment of the cut-off is reasonable given the concerns about possible misspecification of the running variable further away from the threshold point. Also, there should be a decent number of observations in the vicinity of the threshold point which is necessary for the non-parametric approach. For instance, there are almost 1,000 observations with

[10] This causes some fuzziness in the design. The main approach exploits sharp discontinuity, but I also conduct supplemental analysis using a so-called fuzzy regression discontinuity design. Sharp design requires that the probability of treatment changes discontinuously from 0 to 1 at the threshold, whereas fuzzy design only requires that the probability of treatment changes discontinuously at the threshold. Fuzzy RDD is basically equivalent to the IV approach. The jump in the outcome is divided by the jump in the probability of treatment at the cut-off, which yields the local Wald estimate. See e.g. Angrist and Pischke (2009) for more details.

the running variable $s \in [-0.1, 0.1]$ and around half of those are within the interval $[-0.05, 0.05]$ in election years. Several different ways of choosing h for the local linear regression have been proposed. I follow Imbens and Kalyanaraman's (2012) suggestion and choose h such that the criterion $h^* = \text{argmin}\, MSE(h)$ is satisfied. Imbens and Kalyanaraman discuss the technicalities in detail. Henceforth, optimal bandwidth means bandwidth that is chosen following Imbens and Kalyaraman's routine. I report the results using the optimal bandwidth as well as several other bandwidths. This seems reasonable, as the optimal bandwidth selection routine tends to result in rather wide windows.

In addition to choosing the bandwidth, local linear regressions involve choosing a kernel. I estimate local linear regressions using a triangular kernel, which in practice means that observations closer to the cut-off point are given a larger weight than those further away. This weight decreases linearly from 1 to 0, when the width h is moved away from the cut-off. Lee and Lemieux (2010) point out that it has been shown in the literature that a triangular kernel is optimal for local linear regressions. Lee and Lemieux also state that the choice of kernel does not really matter that much and different kernel choices usually yield in very similar estimates.

The approach that I propose is closely related to the solution of Folke (2011) who studies party effects in proportional representation in Swedish municipal councils. The key difference between my and Folke's approach is that Folke fixes the total number of votes and then computes the minimal vote change required to alter the division of seats. He can then exploit close elections as a source of exogenous variation. Folke's approach involves the possibility that, for instance, a right-wing party would have to get votes from the far left. This might be problematic. I assume that the required votes should come from people who did not vote. Indeed, there are many such people, as the turnout has varied between $60 - 80\%$ the in municipal elections held between 1976 and 2008. My approach also differs from Folke's in the sense that the Sainte-Laguë method is used to distribute seats in Swedish municipal elections, whereas the d'Hondt method is used in Finland.

Another related approach is suggested by Freier and Odendahl's (2012a, 2012b). They also exploit close elections as source of exogenous variation. Their idea is to perturbate election results with a normally distributed random variable and then redivide the seats. If the share of seats changes often enough, then the election is considered close. However, in their method, the magnitude of perturbation is chosen somewhat arbitrarily, and the choice of the simulation parameters could affect the results considerably. Freier and Odendahl (2012b) use this approach in a setting similar to this study, and Freier and Odendahl (2012a) exploit it to study partisan effects in German local councils.

A third related approach that could also be used in the context of this study is introduced by Kotakorpi et al. (2013), who develop a bootstrap approach for identifying close winners and losers based on resampling votes from actual data. They then use this information to investigate returns to holding office in the Finnish parliament and local councils. Their method is designed to measure closeness at the individual level, but it should also work well for determining distance from an absolute majority position.

5 Results

5.1 Graphical Analysis

I start my RDD analysis with the conventional graphics. Figure 1 presents total expenditures and total revenues per capita as a function of the running variable s in each year of the electoral term. Also, graphs depicting the annual averages in terms that are fully covered in the data are included. Each

graph depicts a local linear fit with triangular kernel. Furthermore, each observation point depicts average expenditures or revenues per capita within 0.02 intervals in the running variable s. Note that in order to make the graphics more informative, I have restricted the horizontal axis to between -0.5 and 0.5, even though the running variable actually takes values up to 1.

Figure 1 proposes some interesting results about the effect of single-party control on spending and revenues. The graphs characterizing the first, second and third year and the averages during the terms suggest an effect that is consistent with the predictions of common pool models. That is to say, when a party has control over the decision making alone, less is spent and smaller revenues are collected. We see in these graphs that there is a discontinuous jump downwards at the threshold point $s = 0$ in both total expenditures and total revenues. The magnitude of this jump is roughly 200–300 euros per capita, which corresponds to around 4% of average total expenditures or revenues per capita. It seems that this effect gets smaller year by year, although the difference is not that striking for the first three years of terms.

What appears to be happening in the last year of a term, when the municipal elections are held, is interesting. Basically, we do not observe any sort of jump at the threshold, which would indicate that single-party-governed municipalities do not differ from coalition-governed municipalities in terms of total spending and revenues. Could it be that re-electoral concerns affect the decision-making of those local councils in which the largest party barely won the previous election? For instance, Khemani and Wane (2008) and Freier and Odendahl (2012b) suggest that this sort of behavior could occur. This could bring spending and revenues to the same level as they are in coalition-governed municipalities. However, the graphics do not tell everything. The next subsection provides more elaborated analysis and discusses the findings more closely.

5.2 Estimated Effect on Spending and Revenues

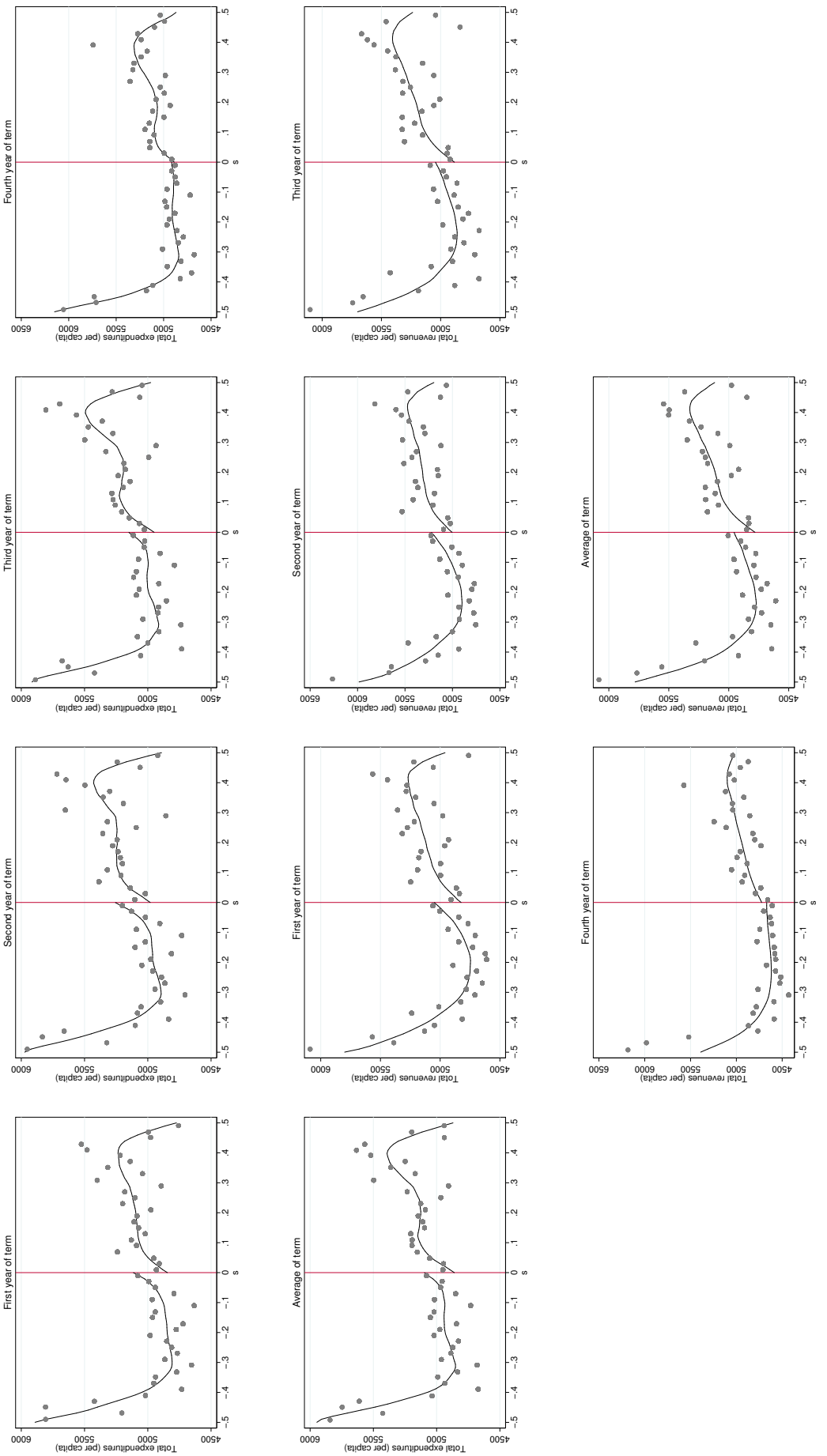
Next, I estimate the effect of single-party control on each economic outcome. Whereas standard OLS estimates do not tell us anything about the causality of this effect, regression discontinuity design allows us to estimate this.[11] I conduct the estimations using local linear regression with a triangular kernel and an optimally chosen bandwidth. Here I also report the regression results using bandwidths of half and twice the optimal. As discussed earlier, identifying the causal effect within a narrow band around the cut-off is reasonable, because the running variable does not necessarily give a good depiction of closeness of elections further away from the threshold point. However, I have also conducted parametric RDD. Parametric results are reported for total expenditures and revenues using fourth order control polynomial.[12]

Table 2 presents estimates for overall spending and total revenues using data for each year of the electoral term and the averages at the end of the term. The results confirm what the RDD graphics in the previous section proposed, and hence support the claim that the effect of single-party control on total expenditures and total revenues is negative. The estimates using data for the first three years of electoral terms are consistently negative. They vary between around 30–330 euros (in absolute terms), depending on the year and bandwidth used, but taking into account the errors, they all fit within the

[11] I do not report the OLS estimates here, but they are available upon request. In general, OLS estimates are very different from those obtained using RD design and also unrobust to the inclusion of control variables.

[12] Parametric regressions, the results of which are reported in this section, do not include control variables. However, the estimates also remain within the same boundaries when controlling for some observed covariates. This notion also serves as a good validity check – as the assignment to treatment and control groups is assumed to be random around the threshold, inclusion of covariates should not greatly affect the estimates.

FIGURE 1: RDD GRAPHICS



same ballpark. On average, these estimates suggest a decrease of 200 euros in total expenditures per capita as a result of single-party control. This corresponds to about 4% of average spending in Finnish municipalities. Furthermore, the estimated effect on total revenues is in a range of 40–310 euros (in absolute terms), the average of reported estimates being about 180 euros. This is also around 4% of average total revenues collected in Finnish municipalities.

Note that the results using bands of $2h^*$ are consistently smaller in absolute terms than estimates obtained using narrower bandwidths and they do not show any statistical significance. This is not that concerning, as bands of $2h^*$ are already very wide, as the optimal bandwidth selection process tends to pick quite large bandwidths (see Table 5). It is very hard to believe that all elections within this window would be close elections that are exploited to identify the causal effect. What is more important is that the results using narrower bands lie within the same boundaries, given that they should be more precise. This is actually the case, as the robustness analysis also demonstrates later for average total expenditures and revenues.

It is hard to draw any strict conclusions from estimates using data for electoral years. However, it seems that the estimates are considerably smaller in absolute terms than those that I obtain using data for other years of electoral term. For smaller bandwidths the effect appears to be negative, but when the bandwidth is increased, the estimates turn positive. However, none of the estimates shows any statistical significance. I make a careful interpretation that single-party control has zero or at least not a very large effect on spending and revenue-collecting in electoral years. This interpretation also seems reasonable given the RDD graphics in Figure 1.

I also estimate the effect on annual averages during the electoral term using data for entirely covered electoral terms in the data set, i.e. data for years between 1981–2008 and municipalities that have not merged in the middle of the term. These results confirm that, on average, single-party-governed municipalities spend less annually.

Table 2: RDD Results for Total Expenditures and Revenues

	Variable							
Year	Total expenditures				Total revenues			
1st	-313.77*	-269.46**	-74.16	-266.56*	-306.51*	-225.15*	-84.24	-263.22*
	(169.67)	(120.46)	(91.09)	(140.83)	(179.36)	(126.46)	(95.75)	(155.99)
2nd	-319.87	-276.59*	-84.15	-250.64*	-296.29*	-217.93*	-81.76	-215.42
	(202.00)	(137.19)	(98.64)	(149.71)	(185.41)	(135.72)	(103.28)	(164.17)
3rd	-324.90*	-200.87*	-27.00	-117.70	-239.54*	-159.38	-35.49	-146.28
	(176.06)	(115.72)	(84.48)	(129.21)	(142.84)	(109.63)	(87.04)	(148.00)
4th	-103.30	-26.78	103.21	39.06	-10.88	55.35	98.59	40.75
	(169.89)	(117.46)	(91.42)	(135.11)	(126.66)	(96.16)	(83.74)	(149.77)
Avg	-335.01**	-236.23**	-65.30	-175.16	-254.88*	-174.30*	-63.00	-160.17
	(167.74)	(110.91)	(83.72)	(126.23)	(148.37)	(109.72)	(85.54)	(141.75)
Band	$0.5h^*$	h^*	$2h^*$	—	$0.5h^*$	h^*	$2h^*$	—

Notes: Results for non-parametric estimations using optimal bandwidth and twice and half of it and parametric estimations using fourth-order control polynomial are reported. Standard errors clustered at municipality level are reported in parentheses. Number of observations in each case: 3,347 (1st year), 3,340 (2nd year), 2,995 (3rd year), 3,422 (4th year), 2,991 (averages). Significance levels: * 10 %, ** 5 % and *** 1 %.

Why do single-party-governed and coalition-governed municipalities differ in the first three years of an electoral term, and why is the effect not that clear in election years? The common pool explanation arguably fits well with the results for the first three years of electoral term. What happens in the election years, then? For instance, the model of the electoral common pool problem by Persson et al. (2007) suggests that the common pool problem results from the re-election-pursuing behavior of parties in a governing coalition. Hence, it is hard to believe that common pool behavior would not occur in election years.

Rather than coalitions changing their behavior, it could be that single-party governments behave differently, as argued by Freier and Odendahl (2012b) and Khemani and Wane (2008). However, it seems that Freier and Odendahl's conceptual framework does not fit here particularly well. A more decent explanation would be that after a very close win, the largest party attempts to guarantee its success in an upcoming election by spending. Increased spending during pre-election years is also a common prediction of political business cycle models (e.g. Rogoff 1990). It is possible, though more elaborated analysis would be needed to confirm this, that this sort of behavior and the common pool problem occur at the same time such that there are no observable differences between single-party and coalition-governed municipalities.

As I do not have data on coalitions inside the local governments, it is unclear, how big coalitions are compared to single-party-governments around the threshold point. If we believe Riker's (1962) idea of minimum winning coalitions, it could be the case that politicians try to form a coalition that is as large as necessary for an absolute majority but not any larger. It could be that the largest party attempts to do this. Close to the threshold point it would probably be sufficient to ally with the smallest party in a local council in order to have absolute power. But such a coalition could be rather fragile. Hence, it might be that the largest party forms a coalition with multiple smaller parties instead of just one or with a small party that is larger than what would be needed for a minimum winning coalition. It could also be the case that the smaller parties ally against the largest party and form a coalition. However, such a coalition might be very weak and hence undesirable. I therefore feel quite comfortable to say that at the boundary, we are comparing rather small coalitions (most likely, coalitions of one large party and one or a few small parties) with absolute majorities. If this is the case, the estimated effect appears to be quite significant.

I continue my analysis by investigating if the effect of single-party control can be seen in specific areas of expenditures or revenues. These results are reported in Tables 3 and 4. The estimated effect follows the same pattern in multiple areas of expenditures: social and health care, education and culture, personnel and investments. However, the estimates are mainly insignificant. There are neither large nor clear differences in taxation or deficits and, moreover, the estimates are not statistically significant. These results remain such also when using other bandwidths than Table 3 reports.

A slightly clearer effect can be seen in the total amount of debt, although the estimates show mainly either no statistical significance or only at the 10% risk level, when using optimal bandwidths. The results suggest that single-party governed municipalities borrow less, the estimated decrease being about 200 euros per capita. Note from Table 5 that the optimal bandwidths for total debt using Imbens and Kalyanaraman's method tend to be quite large. However, this estimate is also robust to making bandwidths narrower than half of the optimal. The effect of single-party control on total debt is smaller during election years but still negative. This finding is related to the suggestions of Roubini and Sachs (1989a, 1989b), who were the first to argue that more fragmented governments have larger debts. This statement is sometimes referred to as the "weak government hypothesis". Later, the topic

has been analyzed in several studies, also using local-level data. For instance, Ashworth et al. (2005) find some support using data for Flemish municipalities. They also provide an extensive list of previous studies investigating the question.

To conclude, my findings from RDD analysis are in line with most previous empirical evidence (e.g. Bawn and Rosenbluth 2006, Persson et al. 2007 and Schaltegger and Feld 2009) as well as with theoretical considerations building on the common pool problem (e.g. Weingast et al. 1981 and Persson et al. 2007). That is to say, single-party-governed municipalities spend less and collect lower revenues per capita than those governed by coalitions. However, this sort of behavior seems to occur only during the first three years of an electoral term. The results using data for election years suggest that there are no systematical differences between single-party and coalition governed municipalities. It is possible that councils led by one party change their behavior during election years due to re-electoral incentives, but the evidence that I present here is merely suggestive.

Table 3: RDD Results for Expenditures

Year	Area of expenditures											
	Social and health care			Education and culture			Personnel			Investments		
1st	-141.97	-103.11	9.03	-72.32	-68.20*	-31.77	-137.17	-88.51	-5.29	-53.55	-11.03	-22.31
	(109.76)	(82.42)	(68.07)	(49.41)	(36.83)	(30.91)	(110.53)	(72.51)	(52.09)	(64.52)	(43.12)	(31.29)
2nd	-143.04	-90.15	17.01	-54.68	-47.56	-19.68	-174.69	-99.51	-1.84	-119.07	-62.10	1.12
	(111.99)	(83.78)	(69.22)	(48.56)	(36.48)	(30.81)	(116.52)	(77.67)	(55.74)	(104.07)	(67.88)	(45.59)
3rd	-108.7	-50.31	28.54	-43.00	-39.17	-9.93	-184.28	-112.10	-16.05	-148.83*	-40.57	19.38
	(99.74)	(75.98)	(62.15)	(55.70)	(38.57)	(31.58)	(119.03)	(77.35)	(56.98)	(83.27)	(59.41)	(43.06)
4th	18.40	53.98	96.56	19.27	21.63	14.83	-65.23	-18.78	31.34	39.91	48.86	17.50
	(100.00)	(77.17)	(64.83)	(50.65)	(36.34)	(31.13)	(102.76)	(68.18)	(54.35)	(51.80)	(40.79)	(31.70)
Avg	-98.59	-50.13	31.10	-37.93	-29.42	-9.02	-183.87	-130.50	-36.20	-85.18	-36.88	9.73
	(92.19)	(73.10)	(60.32)	(53.22)	(37.57)	(30.94)	(123.49)	(79.67)	(57.35)	(67.24)	(48.28)	(35.32)
Band	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$

Notes: Results obtained using optimal bandwidth and twice and half of it are reported. Standard errors clustered at municipality level are reported in parentheses. Number of observations in each case: 3,347 (1st year), 3,340 (2nd year), 2,995 (3rd year), 3,422 (4th year), 2,991 (averages). Significance levels: * 10 %, ** 5 % and *** 1 %.

Table 4: RDD Results for Revenues

Year	Source of revenues														
	Total taxes			Income taxes			Property taxes			Total debt			Deficit (accounting year)		
1st	-73.82	-11.08	44.33	-35.61	-1.96	29.02	-10.46	-1.00	-11.69	-249.10	-204.34*	-221.02**	1.55	-3.93	7.00
	(87.59)	(53.69)	(45.58)	(69.99)	(39.83)	(32.59)	(21.24)	(13.58)	(9.25)	(154.15)	(113.94)	(89.54)	(42.12)	(30.09)	(20.49)
2nd	-42.00	6.96	44.38	-11.60	13.81	36.43	-13.47	-2.56	-14.13	-284.52*	-207.63*	-184.91**	-8.64	0.21	-1.67
	(81.70)	(56.66)	(49.23)	(65.13)	(43.38)	(36.73)	(23.78)	(16.35)	(10.85)	(170.46)	(123.45)	(92.57)	(21.06)	(31.48)	(15.71)
3rd	-42.40	17.74	49.71	-57.14	-6.56	23.04	17.98	14.57	6.58	-201.46	-135.04	-104.86	-20.67	-26.78	-14.38
	(75.21)	(49.09)	(42.77)	(74.44)	(42.16)	(33.94)	(19.05)	(11.60)	(8.70)	(135.60)	(95.99)	(86.47)	(35.05)	(24.15)	(18.26)
4th	69.31	74.18	65.78	31.57	52.32	45.61	18.58	16.08	7.06	-131.94	-61.18	-49.51	-22.87	-43.45	-41.88
	(60.58)	(47.94)	(44.19)	(56.84)	(42.38)	(36.35)	(17.88)	(11.24)	(8.77)	(143.30)	(101.54)	(87.61)	(41.91)	(29.64)	(23.14)
Avg	-34.28	17.55	47.05	-37.27	5.97	27.56	17.02	13.38	3.29	-165.75	-118.01	-106.52	-1.15	-15.04	-15.90
	(80.11)	(51.04)	(43.47)	(64.69)	(39.18)	(32.46)	(17.85)	(11.15)	(8.52)	(145.25)	(101.24)	(77.76)	(24.24)	(17.66)	(12.81)
Band	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$

Notes: Results obtained using optimal bandwidth and twice and half of it are reported. Standard errors clustered at municipality level are reported in parentheses. Number of observations in each case for total taxes, income taxes and deficit: 3,347 (1st year), 3,340 (2nd year), 2,995 (3rd year), 3,422 (4th year), 2,991 (averages). Number of observations in each case for property taxes and total debt: 2,049 (1st year), 2,042 (2nd year), 1,697 (3rd year), 1,693 (4th year), 1,693 (averages). Significance levels: * 10 %, ** 5 % and *** 1 %.

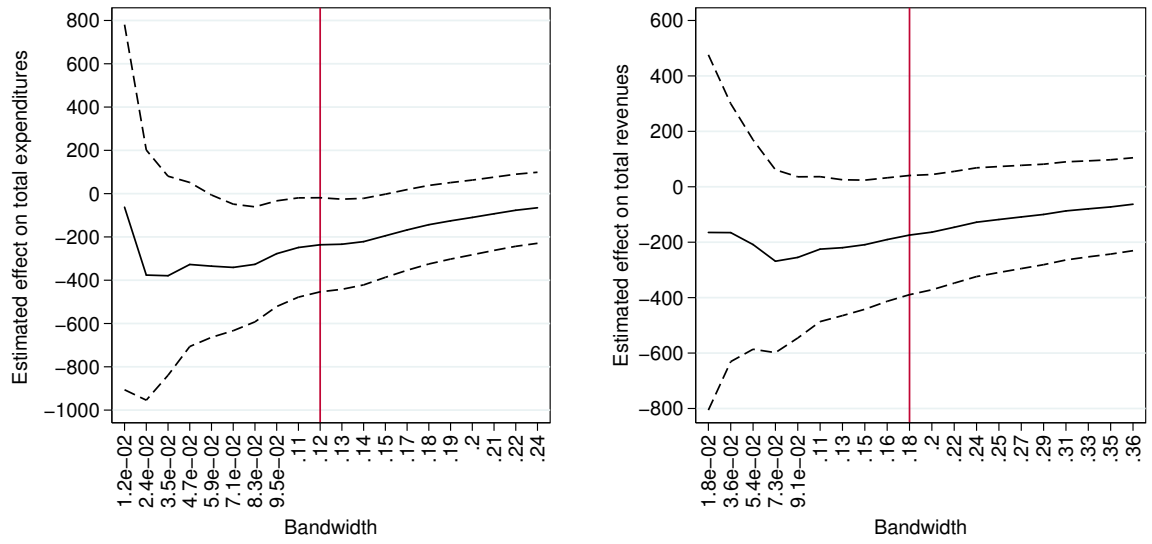
Table 5: Optimal Bandwidth Choices

Variable	Year of term				
	First	Second	Third	Fourth	Average
Total expenditures	0.13	0.12	0.12	0.13	0.12
Social and health care expenditures	0.21	0.20	0.21	0.27	0.24
Education expenditures	0.16	0.17	0.17	0.19	0.18
Personnel expenditures	0.16	0.14	0.15	0.17	0.14
Investments	0.19	0.12	0.12	0.24	0.13
Total revenues	0.16	0.16	0.21	0.27	0.18
Total tax revenues	0.17	0.18	0.20	0.28	0.19
Income tax revenues	0.18	0.18	0.18	0.21	0.20
Property tax revenues	0.21	0.20	0.15	0.16	0.16
Total debt	0.24	0.22	0.39	0.33	0.25
Deficit (accounting year)	0.20	0.29	0.19	0.32	0.22

5.3 Robustness of Results

I begin the robustness analysis by evaluating the robustness of the estimates to different bandwidths. It turns out that there is some variation in the results depending on the width of the window. It seems that the estimates remain relatively stable for bandwidths that are below the optimal, but increasing the band yields smaller and eventually zero results. Given that the optimal windows are already quite wide, this is not that concerning. What is more important is that the results using narrower bands remain in the same ballparks. Figure 2 presents the estimated effect on the term average of total expenditures and total revenues using several bandwidths, $10 - 200\%$ of the optimal bandwidth. Similar findings also apply if the analysis is carried out for each year separately. The graphs follow the standard story about the trade-off between precision and bias, as the confidence intervals become smaller when the bandwidth is increased.

Figure 2: Robustness to Different Bandwidths



Next, I impose restrictions on the sample and study how this affects the results. In each case, I report the results using the optimally chosen bandwidth and half and twice of it. Table 6 reports the results of these estimations. As I mentioned before, my election data do not include information on electoral alliances. Therefore, there are some cases in which the largest party is or is not assigned the majority, even though it did or did not actually gain full control of decision-making. Dropping out these observations does not greatly affect the estimates for the first three years, but the estimates for election years are consistently positive. However, the estimates do not differ significantly from zero. The data set does not totally cover all terms. Hence, I also rule out the cases in which the term is not fully included in the data set and examine how this affects the results. There are no dramatic changes, though it seems that the estimates become slightly larger in absolute terms than previously. Last, I rule out outliers in total expenditures and revenues per capita by restricting the sample to observations above the first percentile and below the 99th percentile. This increases the significance of the estimates, but does not greatly affect the magnitudes.

Table 6 also presents the results of estimations in which only observations involving the Center Party or some other party (mostly the Swedish People's Party but also some others) as the largest party are included. In the latter case, the Imbens-Kalyanaraman routine picks up very high bandwidths, which yields very uninformative and arguably unreliable results. Hence, I prefer to use the same bandwidths as in the estimations reported in Table 3. As we see, the first restriction does not seem to change the estimates very much, although they lose significance, and in the latter case the esimates are partly larger in absolute terms but insignificant. Even though the estimates are not that significant, I suggest that these findings serve as a justification for the argument that the observed effect results from single-party control and is not a partisan effect of Center Party control.[13]

Last, I test the robustness of the results to alternative approaches. First, I conduct fuzzy regression discontinuity design to deal with the fuzziness caused by the lacking information on electoral alliances. Relying on the common pool argument, one might expect that the results using sharp RDD are slightly too small in absolute terms, as there are single-party governments counted as coalition governments and vice versa. As we see, fuzzy RD provides similar estimates, reported in Table 7, to those using sharp RDD, but they are consistently larger in absolute terms than those that I obtain in the sharp design, consistent with this idea. I have also conducted the design as suggested by Freier and Odendahl (2012b). That is to say, I perturbate the election results with a random variable and then recompute the seat shares. Then I determine the close elections and use them to identify the effect on outcomes. See Freier and Odendahl's paper for a closer depiction of the process. The results that I obtain using Freier and Odendahl's method are quantitatively very similar to those that my approach gives, though there is some variation in the results depending on the magnitude of the perturbation. In addition, I have adopted Petterson-Lidbom's (2008) approach by using seat shares as the running variable and 50% seat share as the threshold point. This specification consistently suggests that single-party control has a zero-effect on expenditures and revenues, although one should remember that it involves some difficulties, as I stressed previously.

[13] This argument also seems to be justified in the light of previous empirical evidence. Moisio (2002) links a 10% increase in the seat share of the Center Party to 1% decrease in expenditures, i.e. relatively large increase in seat share is related only to a small decrease in expenditures.

Table 6: RDD Results Using Restricted Samples

Year	Sample	Variable					
		Total expenditures			Total revenues		
1st	Only Center Party	-309.30*	-226.95**	-97.42	-207.95	-170.94	-32.12
		(166.08)	(115.53)	(87.09)	(166.51)	(121.50)	(96.73)
	No Center Party	-503.66	-423.74	-3.01	-646.77	-523.33*	-217.83
		(360.31)	(287.13)	(329.20)	(491.03)	(305.12)	(282.53)
	No false seat divisions	-227.42	-168.16	-4.60	-286.00	-196.50	-56.04
		(186.56)	(131.89)	(98.19)	(195.03)	(136.15)	(102.74)
	No outliers	-287.78*	-313.48***	-138.35*	-359.78**	-259.70**	-123.67
		(151.80)	(106.33)	(80.70)	(157.54)	(112.84)	(85.21)
	Whole term observed	-369.13**	-289.02***	-104.76	-257.85*	-181.97*	-61.76
		(166.36)	(109.64)	(83.62)	(149.34)	(108.25)	(84.22)
2nd	Only Center Party	-319.93*	-239.53*	-84.54	-287.46	-240.79	-108.55
		(190.78)	(129.55)	(94.84)	(207.32)	(154.17)	(115.53)
	No Center Party	-476.38	-453.69*	-10.10	-283.85	-294.27	-145.12
		(366.79)	(264.47)	(290.66)	(524.24)	(364.49)	(309.04)
	No false seat divisions	-208.93	-174.50	9.46	-238.67	-160.92	-18.87
		(211.98)	(144.92)	(103.61)	(195.27)	(139.65)	(106.79)
	No outliers	-304.05*	-298.01***	-133.23	-346.99**	-267.93**	-120.53
		(181.21)	(125.61)	(94.17)	(156.86)	(117.91)	(89.23)
	Whole term observed	-397.64**	-291.15**	-94.53	-254.41*	-163.09	-49.46
		(180.90)	(119.50)	(87.49)	(145.34)	(111.27)	(87.68)
3rd	Only Center Party	-333.29*	-202.19	-68.39	-271.96	-236.08	-131.23
		(192.14)	(123.43)	(85.58)	(200.47)	(144.97)	(110.00)
	No Center Party	-174.92	-241.73	76.45	-255.90	-251.87	-107.52
		(297.09)	(201.18)	(260.99)	(335.15)	(308.91)	(323.80)
	No false seat divisions	-226.51	-129.78	30.31	-219.82	-132.59	-18.62
		(182.97)	(121.89)	(87.69)	(155.85)	(120.84)	(94.23)
	No outliers	-253.26	-163.51	0.00	-256.99*	-157.24	-35.72
		(171.31)	(110.21)	(82.31)	(134.23)	(99.57)	(80.43)
4th	Only Center Party	-160.57	-61.36	36.15	-78.32	-30.48	32.75
		(202.88)	(135.59)	(100.37)	(193.32)	(132.25)	(99.15)
	No Center Party	196.09	129.36	252.47	185.88	44.42	-40.56
		(272.81)	(228.01)	(252.71)	(317.14)	(285.07)	(270.38)
	No false seat divisions	6.73	99.57	148.27*	34.91	76.21	157.74*
		(152.50)	(110.98)	(89.00)	(122.87)	(95.23)	(89.60)
	No outliers	-191.27	-98.26	37.02	-83.12	-6.28	56.31
		(164.29)	(114.90)	(88.10)	(134.67)	(100.81)	(81.72)
	Whole term observed	-251.40	-165.97	-21.82	-165.24	-121.86	-11.29
		(159.17)	(110.14)	(86.27)	(125.19)	(96.09)	(77.45)
	Bandwidth	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$

Table 6 (continued): RDD Results Using Restricted Samples

		Variable					
Year	Sample	Total expenditures			Total revenues		
Avg	Only Center Party	-384.09*	-257.96*	-153.11	-244.69	-232.87	-148.70
		(217.66)	(135.88)	(93.29)	(205.22)	(144.23)	(110.73)
	No Center Party	-185.04	-253.26	48.87	-188.31	-243.56	-158.93
		(299.93)	(199.76)	(257.79)	(361.17)	(270.86)	(269.48)
	No false seat divisions	-252.68	-163.06	9.32	-221.31	-119.44	-11.05
		(162.16)	(112.48)	(85.41)	(142.42)	(109.78)	(88.20)
	No outliers	-340.36**	-233.30**	-53.91	-230.75*	-114.49	-12.15
		(160.56)	(108.44)	(81.16)	(127.36)	(97.30)	(80.64)
	Bandwidth	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$

Notes: Results using optimally chosen bandwidth and half and twice of it are reported, apart from the estimations excluding Center Party majorities, I use the same bandwidths as for the estimations in Table 3. These optimal bandwidths are not reported, but they lie in the same ballpark as for previous regressions. Standard errors clustered at municipality level are reported in parentheses. Significance levels: * 10 %, ** 5 % and *** 1 %.

5.4 Validity Checks

In some recent contributions, the randomness of close election outcomes has been questioned. For instance, Grimmer et al. (2011) and Snyder et al. (2011) propose theoretical models that predict systematic differences between winners and losers even in very close elections. In addition, Grimmer el al. use data from all U.S. House elections and show that candidates with structural advantages (i.e. candidates from the party that controls state offices etc.) are more likely to win in close elections. Caughey and Sekhon (2011) also find differences between winners and losers in close elections. They point out that winners in close U.S. House elections receive more campaign finance and spend more on their campagins.

However, the nature of majoritarian and proportional elections is very different. In a proportional system, it is impossible for the largest party to know the exact threshold in vote share before the election, whereas in a majoritarian system the threshold for winning is always 50% of the votes. Consequently, it should also be impossible for the largest party to know if an election is going to be close or not. As stated by Folke (2011), the type of sorting observed in majoritarian elections should therefore not be too great a concern. In fact, the somewhat complex seat division rule and the way that I exploit this to compute the running variable make the RD design even more credible.

Even so, it is important to conduct various validity tests. The whole identification strategy is based on the idea that close elections would be random, and if there was clear sorting around the threshold, the results could be invalid. Existing literature presents multiple ways of checking the validity of results. For example, Lee and Lemieux (2010) provide a summary of possible validity checks.

I will first check that the observed covariates are in balance on both sides of the threshold point $s = 0$. For the regression discontinuity design, it is crucial that municipalities that are close to cut-off point in terms of seat share are not systematically different. That is to say, at least most of the covariates must be continuously related to the running variable s, although there could be an outside chance that some variables differ between the two groups. Otherwise, the regression discontinuity

Table 7: Results from Fuzzy RDD for Total Expenditures and Revenues

Year	First stage			2SLS			First stage			2SLS		
	Majority dummy			Total expenditures			Majority dummy			Total revenues		
1st	0.74***	0.77***	0.83***	-421.781*	-349.42**	-88.85	0.75***	0.79***	0.85***	-411.08*	-285.89*	-98.75
	(0.06)	(0.04)	(0.03)	(228.52)	(156.92)	(109.22)	(0.05)	(0.03)	(0.02)	(236.76)	(159.11)	(111.94)
2nd	0.74***	0.76***	0.82***	-430.67	-362.49**	-102.11	0.75***	0.78***	0.85***	-397.56	-277.64	-96.14
	(0.06)	(0.04)	(0.03)	(273.79)	(180.88)	(119.86)	(0.05)	(0.03)	(0.02)	(245.65)	(171.74)	(121.20)
3rd	0.71***	0.74***	0.81***	-456.74*	-271.23*	-33.34	0.73***	0.80***	0.86***	-328.04*	-200.18	-41.06
	(0.07)	(0.05)	(0.03)	(254.48)	(157.81)	(104.33)	(0.05)	(0.03)	(0.02)	(194.01)	(137.26)	(100.62)
4th	0.71***	0.74***	0.81***	-145.58	-36.16	127.11	0.75***	0.82***	0.89***	-14.57	67.57	112.07
	(0.06)	(0.04)	(0.03)	(239.23)	(158.47)	(112.36)	(0.04)	(0.03)	(0.02)	(169.27)	(117.45)	(95.30)
Avg	0.71***	0.74***	0.81***	-470.83*	-319.09**	-80.68	0.72***	0.78***	0.85***	-353.24*	-222.97	-73.87
	(0.07)	(0.05)	(0.03)	(242.32)	(151.57)	(103.56)	(0.05)	(0.04)	(0.02)	(203.33)	(139.46)	(100.08)
Bandwidth	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$

Notes: Results obtained using optimal bandwidth and twice and half of it are reported. Both stages use the same bandwidth. Standard errors clustered at municipality level are reported in parentheses. Number of observations in each case: 3,347 (1st year), 3,340 (2nd year), 2,995 (3rd year), 3,422 (4th year), 2,991 (averages). Significance levels: * 10 %, ** 5 % and *** 1 %.

design might be invalid, as units close to the threshold are not fully comparable with each other. Data availability imposes restrictions on the covariate balance test, but I am still able to test for discontinuities in some covariates: year, total population, operating margin (difference between total revenues and total expenditures), fiscal grants received from central government, number of seats in the local council, voter turnout and seat shares of parties.[14] I also test for discontinuities in the lagged value of the outcome variables (Y_{t-4}) and show here results for lagged average expenditures and revenues.

Table 8 reports the results of the covariate balance test using average values at the end of the electoral term. I use data from terms that are covered completely in the data set and, for sake of concistency, optimal bandwidths computed for term average annual expenditures. The same conclusions that I draw here also apply if the test is carried out separately for each year and using optimal bandwidths computed for other specifications. In general, there are no large or statistically significant differences between single-party and coalition-governed municipalities around the cut-off. Hence, the covariate balance test supports the validity of the design. However, there is a larger and rather significant jump in total population. It seems that at the boundary single-party-governed municipalities are considerably smaller than coalition governed municipalities.

One concerning point is that the size of municipality affects the number of seats in the local council. We can also see a corresponding jump downwards in the number of seats. It is often argued in the spirit of the common pool problem that when the number of decision-makers increases, spending also increases. Could it be that the jump that we observe is partly due to this? Not according to previous evidence. Petterson-Lidbom (2012) shows that spending does not increase in Finnish municipalities when the council size increases. Instead, it decreases. Another concern is that larger populations have more heterogenous voter preferences, which might relate to higher spending in the municipality. Also, people in larger cities tend to earn more. This might yield higher tax revenues and also to higher total revenues. Indeed, the data reveal that there is a positive and statistically very significant correlation between per capita total expenditures or total revenues and the size of the population. However, a simple OLS regression suggests that a downward jump of around $1,500$ in population would lead only to an increase of about 10 euros in per capita spending or revenues. Also, when the band is made narrower, the estimates of the jump in population at the threshold start limiting zero and they also lose their statistical significance. For instance, when using bands of $10-40\%$ of the optimal, the jump shrinks and loses its statistical significance. At the same time, the estimated effect of single-party control remains well within the same boundaries as when using bands that are wider. Given these remarks, the jump in total population should not invalidate the design.[15]

The second validity test that I conduct is testing discontinuities at other points than the believed discontinuity point. At these points, the effect should be zero. Imbens and Lemieux (2008) suggest testing for jumps at the median point of the running variable on both sides of the cut-off point. These points are now $s = -0.18$ and $s = 0.17$. Table 9 presents the regression for the total expenditures and revenues results using these fake cut-offs and average numbers for terms that are covered completely

[14] I use operating margin to measure roughly the financial standing of municipalities and test for discontinuities in operating margin to examine if differences in outcomes could result from different financial standings. Lundqvist (2010) points out that fiscal grants tend to increase spending in Finnish municipalities, which makes testing for discontinuity in grants specifically relevant. Furthermore, I have chosen the Center Party and the Swedish People's Party here, because they are commonly the largest parties in Finnish municipalities.

[15] I also analyze the treatment effect by dividing the cases by council size. The number of observations is very limited in case of smaller or larger local councils (below 17 or over 43 seats) which makes any kind of inference very hard, but in the other cases than these, the estimates are virtually same as I show in Section 5.2. Also, a jump in population is then not a concern.

in the data set. I report results using the optimal bandwidth and half and twice of it. We do not observe systematically significant jumps at the fake cut-offs and the estimates are very unrobust to different bandwidths. Hence, this validity test does not raise any concerns. Again, similar results are also obtained when the analysis is conducted separately for all years of an electoral term.

Last, I carry out a density test as suggested by McCrary (2008) to investigate if individuals are capable of manipulating the assignment variable. This should not happen if we want the RDD to be plausible. If there is observable discontinuity in the density of the running variable at the cut-off point, there is reason to believe that individuals might be capable of manipulating the running variable. It is highly unlikely that electoral fraud occurs in Finnish municipal elections, but manipulation could still happen through electoral alliances. It could be that the largest party forms electoral alliances with some smaller parties in order to raise the probability of gaining over half of the seats. If there is no great jump in the density of the running variable at the cut-off point, the McCrary test supports the validity of the design. Figure 3 presents the estimated density function with 5% confidence intervals. As we can see, there is no peculiar jump in the density of the running variable at the cut-off. This also supports the validity of the design.

Table 8: Covariate Balance Test

	Band		
Variable	$0.5h^*$	h^*	$2h^*$
Year	-0.73	-0.80	-0.47
	(1.53)	(1.07)	(0.85)
Lagged average expenditures	-253.72	-138.02	-41.84
	(165.31)	(110.31)	(82.82)
Lagged average revenues	-179.61	-84.40	8.99
	(239.15)	(150.90)	(113.41)
Total population	-1,441.09	-1,405.92**	151.07
	(913.77)	(560.95)	(610.34)
Operating margin	115.09	18.43	-62.40
	(140.27)	(96.22)	(70.20)
Fiscal grants	-96.78	-105.14	-113.22*
	(134.42)	(86.93)	(63.45)
Number of seats	-1.81	-1.74*	-0.19
	(1.42)	(0.91)	(0.71)
Voter turnout	1.18	1.52	0.28
	(1.70)	(1.14)	(0.89)
Seat share of the Center Party	3.82	1.66	0.55
	(2.88)	(1.62)	(1.47)
Seat share of the Swedish Party	-0.24	0.52	-0.08
	(2.58)	(1.41)	(1.35)

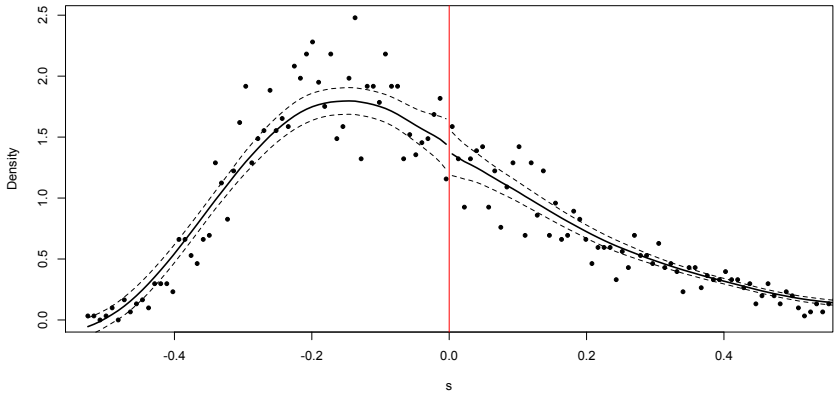
Notes: Results using optimally chosen bandwidth (for average total expenditures during terms) and half and twice of it are reported. Standard errors clustered at municipality level are reported in parentheses.$N = 2,986$ for lagged average expenditures and revenues and $N = 2,991$ for all other variables. Significance levels: * 10 %, ** 5 % and *** 1 %.

Table 9: RDD Results Using Fake cut-offs

cut-off	Variable					
	Total expenditures			Total revenues		
-0.18	-206.25	-99.83	-66.76	-183.91	-71.51	25.60
	(163.12)	(119.71)	(99.41)	(157.89)	(113.82)	(93.55)
0.17	312.04**	19.73	61.29	188.43	-2.51	76.77
	(157.90)	(115.63)	(98.55)	(180.22)	(124.29)	(103.05)
Band	$0.5h^*$	h^*	$2h^*$	$0.5h^*$	h^*	$2h^*$

Notes: Results using optimally chosen bandwidth and half and twice of it are reported. These optimal bandwidths are not reported, but they lie in the same ballpark as for previous regressions. Standard errors clustered at municipality level are reported in parentheses. $N = 2,991$. Significance levels: * 10 %, ** 5 % and *** 1 %.

Figure 3: McCrary Test



6 Concluding Remarks

This study analyzes the effect of single-party control on economic outcomes in Finnish municipalities. Single-party control is quite common in Finnish municipal councils. The largest party holds more than half of the seats in every third Finnish local council. Common pool models (e.g. Weingast et al. 1981 and Persson et al. 2007) predict that when there is a governing coalition, all parties aim at target some spending at their core constituents, while the costs are shared equally across all parties. This results in higher spending. There are also arguments for the opposite effect, but the empirical results of this study support the prediction of common pool models.

On average, the results using data for first three years of the electoral term suggest that single-party control decreases total expenditures and revenues by around $200 - 300$ euros per capita. This magnitude appears to be quite significant, as the decrease corresponds to roughly $4 - 6\%$ of average annual spending or revenues per capita. However, the results using data for election years show that there are no clear differences between coalition and single-party-governed municipalities. It could be that single-party governments change their behavior due to re-electoral concerns, but more elaborated analysis would be needed to confirm this. I also analyze the effect in several areas of spending and

revenues. The estimates for different areas of expenditure follow the same patterns as the estimates for total expenditures, but they are mainly not statistically significant. Results concerning the effect on tax revenues and deficits are not that clear, but I find some evidence that the effect of single-party control on debt is negative. I also evaluate the robustness and validity of the results carefully and conclude that they are robust to using narrower bandwidths and restricted samples and that the design passes standard validity results.

The results that I obtain in this study are in line with most previous empirical findings, but the analysis also has new aspects in four ways. First, my findings suggest that local politicians do not necessarily behave in the same way during the whole term. No large differences between coalition and single-party-governed municipalities are observed during election years, whereas they seem to differ during the first three years of the term. Second, most previous empirical studies compare multiple democratic countries with different kinds of electoral systems, whereas this study compares different units within the same electoral system and with the same institutional background. Third, a similar regression discontinuity approach has not been used previously to analyze this question. I use seat division rules to compute the running variable. And fourth, there are no studies on the topic using Finnish data. Considering the important economic role of municipalities and the commonness of single-party control in Finland, this study seems to provide an answer to a weighty question.

There are still many intriguing questions related to single-party control that remain unanswered. A common argument in popular discussions is that single-party control tends to be very persistent. Some political economy literature studies incumbency advantages in elections. Lee (2007) develops a regression discontinuity design to test whether the incumbent party has drawn advantage from its incumbency in the U.S. House of Representatives elections. He finds that estimates of the incumbency advantage are usually in the order of ten percent of all votes in the coming election. Liang (2011) attempts to identify similar effects in Swedish local council elections. It would be interesting to see if there is a ruling effect for the parties that alone hold over half of the seats in Finnish local councils. Another often-heard argument is that when one party has total control over decision-making, the other parties do not matter. However, this claim has not yet been evaluated in academic studies. Folke (2011) and Freier and Odendahl (2012a) study causal effects of party representation in Swedish and German municipalities, which also have proportional elections. However, neither Folke nor Freier and Odendahl study the party effects of smaller parties when one party has gained over half of the seats. Finnish data might might make it possible to study, for example, the impact of left-wing parties on taxation or of the Green Party on environment-related spending.

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